LBO-HDMI-AD

LINK BRIDGE™ FIBER OPTIC
HDMI VIDEO CONVERTING
TRANSMITTER SYSTEM

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SAFETY INSTRUCTIONS AND COMPLIANCE DECLARATIONS

PLEASE OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AS OUR PRODUCTS CONTAIN

CLASS I LASER PRODUCTS

WARNING

Do not disconnect the fiber optic connector while the unit is powered up. Exposure to laser radiation is possible when the laser fiber optic connector is disconnected while the unit is powered up.

Although the fiber optic connectors in this product emit only Class 1 energy that is below the levels considered to be hazardous, one should never stare directly into a fiber optic connector or an unconnected fiber end unless one can be certain that no exposure to laser energy could occur.

CAUTION

This manual is intended for use by trained service personnel. The use of controls, making adjustments, or performing operations other than those specified may result in hazardous radiation exposure.

The following label or equivalent is located on the surface of laser products. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

Class 1 Laser Product
Complies with FDA performance
standards for laser products
except for deviations pursuant
to Laser Notice No. 50,
dated July 26, 2001

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

TABLE OF CONTENTS

1.0 PRODUCT DESCRIPTION 5
2.0 SETUP 8
2.1 MOUNTING 8
2.2 CABLING AND CONNECTORS 8
2.2.1 ELECTRICAL CABLE CONNECTIONS 9
2.2.1.1 HDMI VIDEO INTERFACE 9
2.2.1.2 AUDIO INTERFACE 10
2.2.1.3 SERIAL DATA INTERFACE 11
2.2.2 OPTICAL FIBER CONNECTION 12
2.3 DC POWER CONNECTION 14
2.4 IN-WALL POWER/FIBER WIRING INSTRUCTION 15
3.0 OPERATION 18
4.0 MAINTENANCE AND TROUBLESHOOTING 19
4.1 MAINTENANCE 19
4.2 TROUBLESHOOTING 19
5.0 SPECIFICATIONS 21
6.0 SERVICE PROCEDURE 23
6.1 REPLACEMENT POLICY 23
6.2 RETURN AND REPAIR SERVICE 23
7.0 LIMITED WARRANTY 24

1.0 PRODUCT DESCRIPTION

The LBO-HDMI-AD Series is a high performance, low cost, miniature, Link Bridge™ Fiber Optic HDMI Transmission System. It carries one (1) unidirectional HDMI video, one (1) bi-directional stereo audio and two (2) RS-232 through one multimode fiber. This unique fiber optic transmission system lets your digital flat panel display extend up to 400m at WUXGA (1920x1200 @ 60Hz) or 720p/1080i/1080p HDTV video resolution. DVI video is also available through a DVI-to-HDMI adapter cable.

No user adjustment is required for the LBO-HDMI-AD system due to the use of advanced digital fiber optic transmission system technology with zero compression and zero bit reduction. This allows for a quick and easy setup, offering trouble-free operation for many years to come. In addition, the LBO-HDMI-AD transmitter (or receiver) is compatible with our LBO Series receiver (or transmitter). This makes both fiber transmission and HDMI/DVI/VGA/YPbPr/SV/CV/SDI conversion in one single system setup. The LBO-HDMI-AD comes with either a standalone miniature enclosure or a Decora wall-plate packaging. The units are easily monitored by power and link LED indicators.

Figures 1-1, 1-2, 1-3 and 1-4 illustrate the front and rear panels of the LBO-HDMI-AD-T and LBO-HDMI-AD-R units.

FRONT PANEL (STANDALONE)

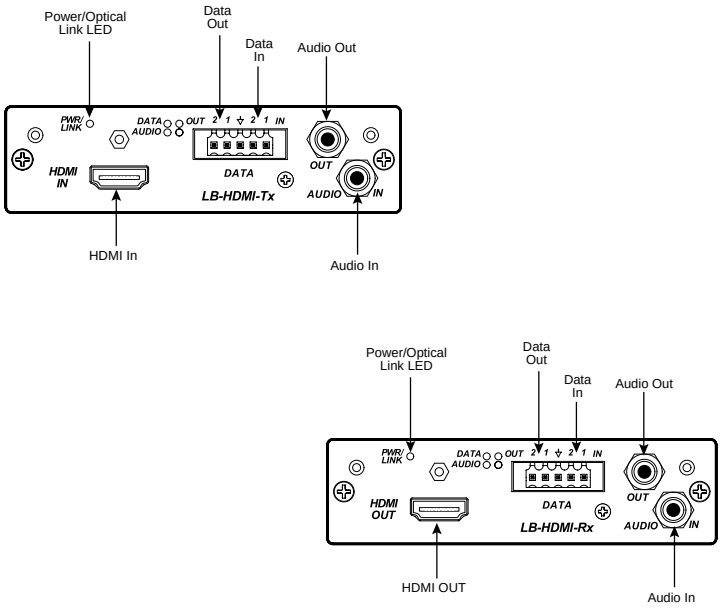

Figure 1-1
LBO-HDMI-AD-T/R Front Panel

REAR PANEL (STANDALONE)

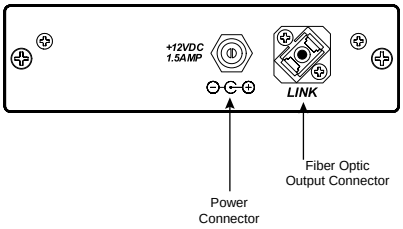

Figure 1-2
LBO-HDMI-AD-T/R Rear Panel

FRONT PANEL (WALL PLATE)

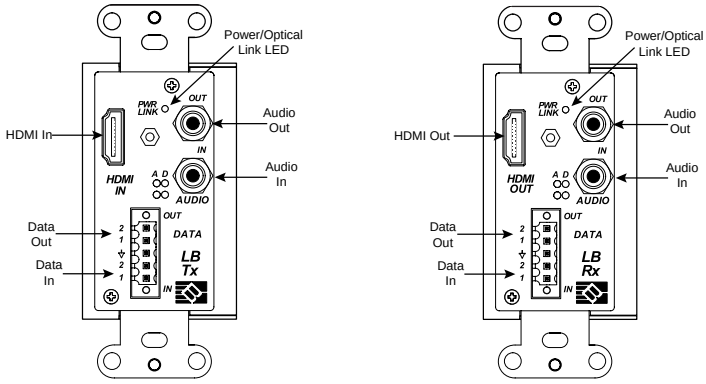

Figure 1-3
LBO-HDMI-AD-T/R-WP Front Panel

REAR PANEL (WALL PLATE)

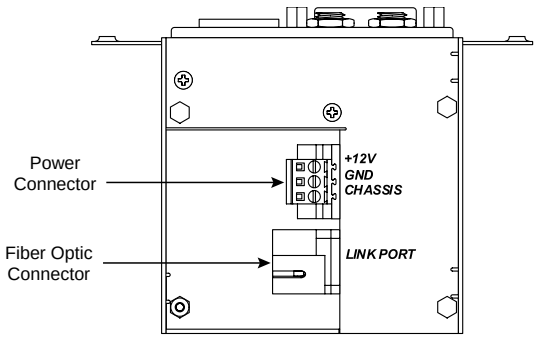

Figure 1-4
LBO-HDMI-AD-T/R-WP Rear Panel

2.0 SETUP

LBO-HDMI-AD-T (or LBO-HDMI-AD-R) is a transmitter or receiver and they can be paired with any DVI/HDMI centric LBO receiver (such as LBO-DVI-R). One LBO-HDMI-AD-T transmitter unit is located at the near-end and connected through one optical fiber, to the LBO-HDMI-AD-R receiver located at the far-end of the link. Figure 2-1 depicts a typical installation for the LBO-HDMI-AD-T/R.

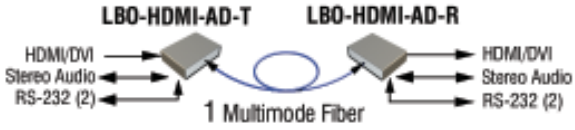

Figure 2-1
Mini-HDMI-AD-T/R Setup

2.1 Mounting

Before installing the units into your housing, make sure there is enough space to pull and connect both the electrical and optical cables without stressing them beyond the manufacturer's limitations (also known as the minimum bend radius).

2.2 Cabling and Connectors

In order to setup the LBO-HDMI-AD-T/R properly, make sure to observe the following instructions when installing the proper cables. The LBO-HDMI-AD-T/R requires two parts to the cabling setup, the electrical and the optical.

2.2.1 Electrical Cable Connection

The three available cable connections on the electrical side are for HDMI video, audio and data connections. Follow the proceeding instructions in order to properly install your electrical connections.

2.2.1.1 HDMI Video Interface

The HDMI video connection is the HDMI plug connectors for video input and output ports. Use the following instructions to properly connect your component video as illustrated in Figure 2-2.

1. Connect the LBO-HDMI-AD-T (Transmitter) unit's to HDMI video input port to the user's HDMI video source with the appropriate HDMI cables.
2. For the receive unit, connect the LBO-HDMI-AD-R (Receiver) HDMI video output ports to the user's HDMI video receivers with the appropriate HDMI cables respectively, as illustrated in Figure 2-2.

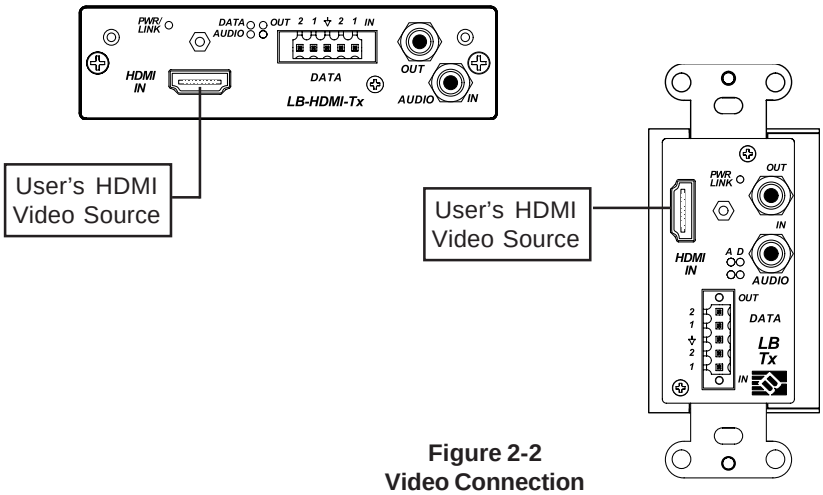

Figure 2-2
Video Connection

2.2.1.2 Audio Interface

The audio interface supports two channel high fidelity transmissions. Two separate mono channels or one stereo channel is transmitted in each direction. Line-level audio signals are connected to the LBO-HDMI-AD units. The following steps illustrate the installation procedures for audio devices.

To send audio signals, label and connect one stereo audio-jack cable to the "AUDIO OUTPUT" connector of the line level audio source. On the LBO-HDMI-AD unit, connect the other end of the cables to the front panel stereo jack connector labeled "AUDIO IN" (see Figure 2-3a).

To receive audio signals, at the far-end location, label and connect one stereo audio-jack cable to the "AUDIO INPUT" connector of the line level audio receiver. On the LBO-HDMI-AD unit, connect the other end of the cables to the front panel stereo jack connector labeled "AUDIO OUT" (see Figure 2-3b).

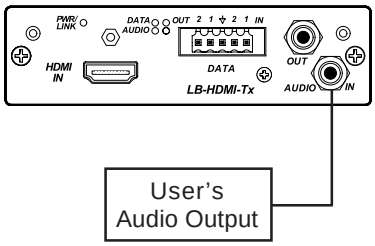

Figure 2-3a
Audio input to LBO-HDMI-AD unit

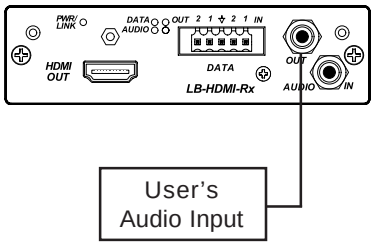

Figure 2-3b
Audio output to LBO-HDMI-AD unit

2.2.1.3 Serial Data Interface

Each LBO-HDMI-AD unit can be used for RS-232 interface.

RS-232 data
The LBO-HDMI-AD transmits two channels of data signals. Follow the procedures for installing data terminal devices.

1. Label and connect one serial computer data cable to the user's RS-232 device.
2. Connect the other end of this cable to the front panel data terminal block connector on the LBO-HDMI-AD (see Figure 2-4).

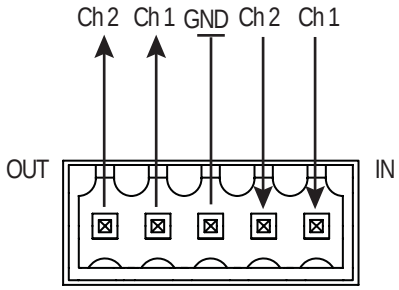

Figure 2-4
RS-232 Terminal block pinout

2.2.2 Optical Fiber Connection

Most cable manufacturers identify individual fibers in the fiber cable. Select an appropriate terminated fiber. Each unit's optical ports in the system are specified for use with Multimode (62.5/125 or 50/125 micron) fiber. Follow the ensuing instructions on installing and connecting the fiber optic links:

1. Ensure the power is off before proceeding with the fiber optic cable installation.

2. Prior to connecting the fiber optic cables, remove and save the dust caps from the optical port of the LBO-HDMI-AD units. Clean the fiber optic connector and use a lint-free cloth dampened with alcohol to thoroughly wipe the side and end of the ferrule.

3. Connect the fiber from one unit to the other connecting the near end LBO-HDMI-AD-T unit's optical port to the far end of the LBO-HDMI-AD-R unit's optical RX port as illustrated in Figure 2-5.

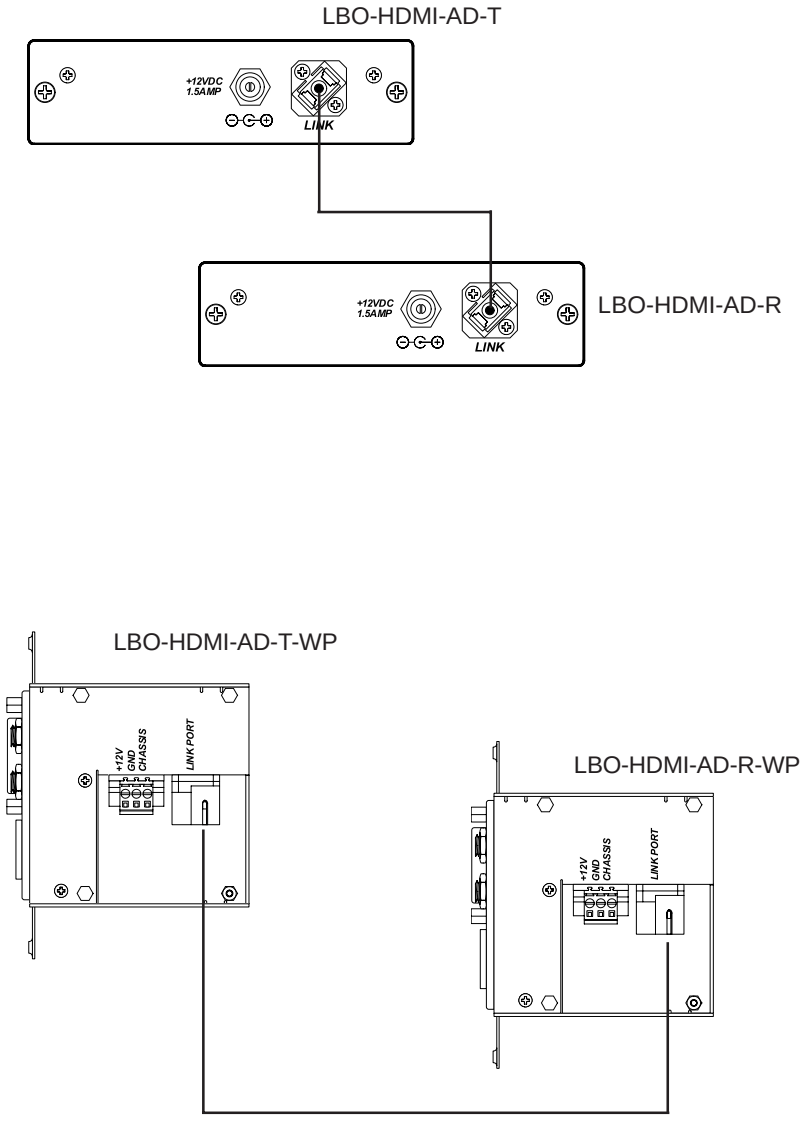

Figure 2-5
Fiber Optic Connection

2.3 DC Power Connection

Congratulations! You are now ready to power up the LBO-HDMI-AD and set up your network connection. In order to make sure that you have a proper installation, please observe the following:

1. Your AC jack has power.
2. The 12VDC power supply is working.
3. Your electrical system has proper grounding (this ensures that your power supply does not suffer from voltage variations).
4. **Power Surge Protection. This is optional**, but highly recommended. A UPS system provides voltage regularity as well as prevents spikes from occurring, thus protecting your LBO-HDMI-AD from sensitive voltage conditions.

The LBO-HDMI-AD derives power from an external 12VDC power supply. This power supply is a wall mounted AC/DC adapter, 100-240 VAC, 50-60 Hz, at 1.5A. This power supply comes standard for the LBO-HDMI-AD unless otherwise specified.

If you have any problems or concerns, regarding the installation, make sure that you have taken the proper steps to ensure a proper power connection. Otherwise, feel free to contact us for any questions you may have.

2.4 In-Wall Power/Fiber Wiring Instruction

The in-wall power/fiber installation for the LBO-HDMI-AD-WP (wall plate version) must confirm national and local electrical codes, e.g., UL junction boxes shall be used and DC power source shall not exceed product rated range (+12VDC @ 1.5A). Follow the following steps for power/fiber installation:

1. As shown in Figure 2-6, feed both fiber and power cables through the opening of the wall box, and secure the cables with cable clamps to provide strain relief.

2. Terminated fiber with SC optical connector to be directly plugged into the SC connector port of the LBO-HDMI-AD-WP units (see Figure 2-5).

3. Before connecting power wire to the LBO-HDMI-AD-WP unit, **make sure power supply is off**. Prepare the Positive (+12V) and Negative (GND or +12V return), and chassis ground (CHASSIS to earth ground) tip of the power wire as shown in Figure 2-7 to be directly plugged into the captive screw +12VDC connector of the LBO-HDMI-AD-WP units (see Figure 2-6). Make sure the polarity of the connection is correct. Insulate any exposed wire shields to prevent short circuits.

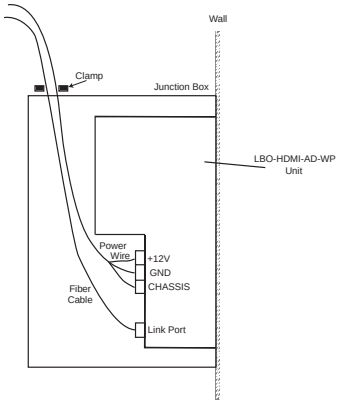

Figure 2-6
In-wall fiber/power cable installation

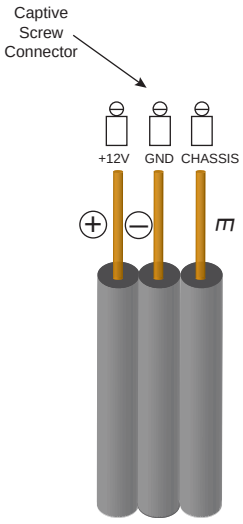

Figure 2-7
Power Connection

Note 1: During installation, the installer may need to connect the power supply output to an appropriate Listed NEC type cable before it is routed behind a wall. Simply routing the power supply output cable behind a wall will most likely not comply with applicable installation requirements. Unit should only be powered by a power source that is Listed (NEC) Class 2 or a Listed ITE Power Supply marked/rated as LPS or Limited Power Source.

Note 2: The installation shall be in accordance with the applicable provisions of the National Electrical Code ANSI/NFPA 70, Article 725 and the Canadian Electrical Code, Part 1, Section 16.

Note 3: The power supply shall not be permanently fixed to the building structure or similar structures.

Note 4: The power supply shall not be located within environmental air handling spaces or within the wall cavity.

Note 5: The power supply is to be located within the same vicinity as the A/V processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium or desk.

3.0 OPERATION

After the installation procedure is completed, the units are ready for operation. To operate the LBO-HDMI-AD units, simply apply power as indicated in the previous sections. The following describes the LED activity.

LED Indicator	Description
PWR/LINK	When power is connected, this LED turns RED. When power and optical link are on, this LED turns GREEN

Table 1
LED Indicator

4.0 MAINTENANCE AND TROUBLESHOOTING

4.1 Maintenance

There is no operator maintenance other then keeping the units clean. However, observe the following light indicators to make sure that the unit is working properly:

4.2 Troubleshooting

If the LBO-HDMI-AD units do not operate properly after installation, check for: possible cable breaks, loose connections, and incorrect cable connections. If a problem exists on the fiber link, please check your fiber connectors for improperly cleaned fiber cables and connectors. If problems persist that may be fiber related, contact BCI at 1-800-214-0222 for further assistance.

For electrical problems, perform the following troubleshooting procedures:

1. **If the POWER indicator is OFF, check for the following:**
   a. The line cord is plugged into the unit and your outlet has power.
2. **If the POWER indicator is ON, but the Optical Link indicator is OFF, check for the following:**
   a. Make sure the appropriate (Multimode) fibers are being used.
   b. Fiber and fiber connectors are not broken.
   c. For each unit, the transmit (TX) fiber is connected to the other unit's receiver (RX).
3. **If the POWER indicator and Optical Link indicator are ON, but the audio/video channels are not operating, then:**

a. Check to see that the attached user equipment is turned on.

b. Both ends of the link are connected to the corresponding equipment and to the same corresponding channel port.

c. Cable connections at both the video/audio channels are securely fastened to each connector. Turn the power off, then back on to reset the link.

5.0 SPECIFICATIONS

Video

Resolution	Up to 1080p@60Hz or 1620x1200@60Hz
Connector	HDMI Female Plug
Protocol	DDC/EDID/HDCP Capable

Audio

Channel Capacity	2
Operating Mode	Unbalanced (Stereo Audio), Bi-directional
Input/Output Impedance	10k/50 Ohms (Stereo Audio)
Max. Input/Output Level	5 dBu/4Vpp (Stereo Audio)
Magnitude Freq. Response	20Hz to 20kHz @ -3dB
THD+N	>70 @ 1k Hz (Stereo Audio)
Connector	3.5mm Stereo Jack

Serial Data

Channel Capacity	2
Signal Format	RS-232
Data Rate	Up to 57.6kbaud
Connector	Terminal Block

Optical

Fiber Type	Multimode
Number of Fibers	1
Connector	SC

Physical

Dimension	
Standalone	4.17"(W) x 4.1"(D) x 1.1"(H)
Wallplate	1.75"(W) x 2.70"(D) x 2.81"(H)
Power Level (max.)	+12VDC @ 1.5A
Operating Temperature	0 to +50°C
Humidity	0 to 95% RH, non-condensing

Ordering Information

LBO-HDMI-AD-T-M-SC	Fiber Transmitter, Multimode, 1-Fiber	HDMI → 2A ↔ 2 RS-232 ↔
LBO-HDMI-AD-R-M-SC	Fiber Receiver, Multimode, 1-Fiber	

Add -WP for Wallplate configuration
Add -CH for LBO-CH Chassis mounting kit
Add -UPS for International Universal Power Supply

6.0 SERVICE PROCEDURE

6.1 Replacement Policy

Standard products found defective on arrival (DOA) will be replaced, based on availability, within 24 to 48 hours anywhere in the U.S. Please call Customer Service at **800-214-0222** for information.

6.2 Return/Repair Service

The LBO-HDMI-AD System contains no user serviceable components. If you have a problem with your unit, please contact the Customer Service Department. To facilitate our return/repair processing please contact Broadata Communications, Inc. to obtain a Return Material Authorization (RMA). Please include the following information:

- Product model number
- Serial Number
- Complete description of problem
- Hardware installation description

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(310) 530-5958 (Facsimile)
e-mail: CustomerService@Broadatacom.com
Website: www.broadatacom.com

7.0 LIMITED WARRANTY

Broadata Communications, Inc. (BCI) warrants, for a period of one year from date of shipment, each product sold shall be free from defects in material and workmanship. BCI will correct, either by repair, or at BCI's election, by replacement, any said products that in our sole discretion prove to be defective and are returned to the manufacturing location within 30 days after such defect is ascertained. All warranties are limited to defects arising under normal use and do not include malfunctions or failure resulting from misuse, abuse, neglect, alterations, electrical power problems, usage not in accordance with product instructions, improper installation, or damage determined by BCI to have been caused by the Buyer or repair made by a third party. Limited warranties granted on products are to the initial customer end-user and are not transferable. OUR LIABILITY UNDER THIS WARRANTY SHALL IN ANY CASE BE LIMITED TO THE INVOICE VALUE OF THE PRODUCT SOLD AND BCI SHALL NOT BE LIABLE TO ANYONE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM THE USE OF ITS PRODUCTS OR THE SALE THEREOF. We make NO WARRANTY AS TO THE MERCHANTABILITY OF ANY GOODS, OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE OR END APPLICATION NOR DO WE MAKE ANY WARRANTY, EXPRESSED OR IMPLIED OTHER THAN AS STATED ABOVE.

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